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Making Science Fun With Storybots: Subtitling Metaphors in Educational Cartoons

Amina Tahraoui Taous Gacemi

Cartoons play a significant role in children's learning, especially when combining scientific concepts with fun and humor. Subtitling these valuable resources deserves our attention as the quality and the comprehensibility of the resulting audiovisual product matter. In this regard, the present paper aimed to investigate translation strategies used for subtitling science-related intersemiotic metaphors in Netflix educational cartoon *Ask the StoryBots*. The cognitive model of Lakoff and Johnson (2003) and the concept of "polysemiotic message" (Pedersen, 2015) were considered for analysis. Qualitative data analysis also adopted a set of subtitling strategies based on the combination of Pederson's (2015) strategies for subtitling visualized metaphors and Alshunnag's (2016) strategies for translating metaphors in biomedical texts. Findings revealed that proper handling of intersemiotic metaphors requires careful consideration of all the audiovisual channels to convey both the intended meaning and effect lying behind the metaphors. Key priorities for the subtitler are delivering the metaphorical meaning, maintaining the intersemiotic cohesion between the channels, and ensuring adequate understanding among the young target audience.

Keywords: audiovisual translation, educational cartoons, English-Arabic subtitling, intersemiotic metaphors, science

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Amina Tahraoui, Assistant Professor, Department of Translation, College of Languages, Princess Nourah bint Abdulrahman University, Saudi Arabia, E-mail: ATahraoui@pnu.edu.sa
Taous Gacemi, Associate Professor, Translation Institute, Algiers 2 University, Algeria, E-mail: taous.gacemi@univ-alger2.dz

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故事機器人讓科學變得有趣：教育卡通中的隱喻字幕

Amina Tahraoui　Taous Gacemi

卡通在兒童學習中扮演重要角色，尤其是將科學概念結合趣味和幽默的時候。為這些寶貴資源製作字幕應該受到重視，因為它們所產生的視聽產品品質和可理解性非常重要。就此而言，本文旨在研究 Netflix 教育卡通片《知識小奇兵》（*Ask the StoryBots*）中與科學相關跨語言隱喻字幕所使用的翻譯策略。分析時採用了 Lakoff 與 Johnson（2003）的認知模型及 Pedersen（2015）的「多符號訊息」概念。質性資料分析亦採用一套字幕策略，其基礎是結合 Pederson（2015）的可視化隱喻字幕策略和 Alshunnag（2016）的生物醫學文本中隱喻的翻譯策略。研究結果顯示，恰當處理跨符號隱喻需要仔細考量所有視聽頻道，以傳達隱喻背後的意圖和效果。字幕製作者的主要任務是傳達隱喻意義、維持頻道間的語言連貫性，以及確保年輕的目標受眾能夠充分理解。

關鍵詞：視聽翻譯、教育卡通、英文—阿拉伯文字幕、跨符號間隱喻、科學

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Amina Tahraoui, Assistant Professor, Department of Translation, College of Languages, Princess Nourah bint Abdulrahman University, Saudi Arabia, E-mail: ATahraoui@pnu.edu.sa
Taous Gacemi, Associate Professor, Translation Institute, Algiers 2 University, Algeria, E-mail: taous.gacemi@univ-alger2.dz

Introduction

Cartoons hold an important place in children's lives, creating moments of joy and transporting them to a magical world of fantasy. Through imaginary characters, children learn about the world around them, exploring themes such as human relationships, the significance of family and friendship, and concepts of good and evil. The content of cartoons, including humorous scenes, significantly influences children's social interactions (Abu Ya'qoub, 2013, p. 18). Engaging stories that combine sound, image, and movement have multiple effects on cognitive development and behavioral characteristics. Educational institutions recognize this potential and strive to utilize cartoons as pedagogical tools to achieve various educational objectives (Al-Moumeni et al., 2011, p. 653).

In education, traditional teaching methods often struggle to effectively explain complex topics, such as planetary motion or the movement of blood within vessels. Educational cartoons simplify these scientific concepts, enhancing understanding and facilitating knowledge acquisition. When used in the classroom, they foster enthusiasm and dynamism among students, positively impacting learning and achievement (Al-Moumeni et al., 2011, p. 654). A study investigating the impact of cartoons on teaching science to sixth-grade students focused on the unit "Human Body and Its Health" from Jordan's sixth-grade science curriculum, using the animated program "Kān Yā Makān" (Once Upon a Time). The experimental group that received cartoon-based instruction for one month scored higher on the final science test (Al-Moumeni et al., 2011, p. 656). Based on their findings, the researchers emphasize the necessity of using educational animation programs in teaching science to primary school students (Al-Moumeni et al., 2011, p. 676). Similar studies support this perspective, indicating that educational cartoons help students develop skills and achieve instructional objectives while motivating them

to explore scientific phenomena (Al-Moumeni et al., 2011, p. 667).

In another study, Pathmanathan (2014) explored the benefits of humor in "informal science learning" (p. 94). Through interviews and classroom observations with children aged 7 to 11, she concluded that animated films, which are both entertaining and scientifically accurate, are beneficial for learning science, such as "*Finding Nemo*," which contains information about marine biology. Pathmanathan (2014) argues that both educational and entertainment programs that include accurate factual information combine humor with education. These programs allow children to learn through emotional engagement, as "emotional scenes" can trigger the release of "noradrenaline" in the brain, enhancing memory (Southwick et al., 2002, as cited in Pathmanathan, 2014, p. 97). She asserts that mild emotions and humor are particularly effective for improving memory, facilitating both declarative and procedural types of long-term memory. It seems that the second type comes into play and allows children to process scientific information cognitively from entertaining programs (Pathmanathan, 2014, p. 97). In her research, including references to the film *Finding Nemo*, she suggests that mild humor may increase "engagement and attention" among students. Thus, she highlights the role of entertainment programs as powerful tools that can motivate students to explore science (Pathmanathan, 2014, pp. 104-105).

Given this context, the present paper aims to investigate the translation strategies used for subtitling science-related metaphors in *Ask the StoryBots*, an educational cartoon available on Netflix, a streaming service that enables members to view a variety of programs on any device with an internet connection. As demonstrated, cartoons can significantly enhance children's learning by combining scientific concepts with entertainment. The two episodes analyzed in this study (Spiridellis & Spiridellis, 2018a, 2018b) use metaphors to simplify concepts related to health, immunity, and disease. A metaphor is a figure of speech where the

speaker compares one thing to another (Kövecses, 2010), such as "time is money," to explain, convince, or express emotions more effectively.

Metaphors are frequently employed in popular science to engage a non-specialized audience. In "popular biomedical discourse," they play a crucial role in making this field accessible to the "lay reader" (Alshunnag, 2016, pp. 72-73). However, translation studies have primarily focused on metaphors in literary discourse, with limited attention given to metaphors in scientific genres (Ashuja'a et al., 2019, p. 26). Furthermore, metaphors in audiovisual contexts have been even less explored. According to Pedersen (2015), they are often overlooked, especially in subtitling (p. 167).

In the Arab context, as far as the researchers know, audiovisual translation of scientific material, particularly for children remains largely under-researched. Most existing studies focus on movies, series, or non-educational cartoons. This study aims to fill that gap, providing insights into this significant area of children's education. It seeks to answer the following central questions:

1. What subtitling strategies are used to translate intersemiotic metaphors in *Ask the StoryBots* from English into Arabic?
2. What challenges are associated with subtitling intersemiotic metaphors?

This paper adopts Lakoff and Johnson's (2003) cognitive view of metaphors and more importantly, Pedersen's (2015) concept of the "polysemiotic message" (p. 177). "Polysemiotic" refers to the combination of different semiotic systems often found in audiovisual programs. Data analysis will utilize a set of subtitling strategies based on Pedersen's strategies for subtitling visualized metaphors and Alshunnag's (2016) strategies for translating metaphors in biomedical texts. The analysis will be qualitative.

Metaphors

Following the cognitive perspective, Lakoff and Johnson (2003) developed a theory suggesting that metaphors are not merely literary devices, as traditionally viewed, but are as fundamental to our lives as "our sense of touch." They argue that metaphors are "pervasive in everyday life, not just in language but in thought and action" (p. 237). Our ordinary conceptual system is "fundamentally metaphorical in nature" (p. 3), indicating that our thinking and actions are deeply intertwined with metaphors. Metaphorical thinking occurs frequently and often unconsciously (p. 272).

In scientific contexts, metaphors serve as "an effective tool for communicating, explaining, simplifying, […] thus popularising specialised knowledge" (Alshunnag, 2016, p. 71). Many biomedicine specialists recognize their value in familiarizing readers with complex concepts (Alshunnag, 2016, p. 73). Thus, Lakoff and Johnson's (2003) cognitive view of metaphors is relevant to this study on science-related metaphors, as it acknowledges their communicative functions beyond poetic and aesthetic uses.

Lakoff and Johnson (2003) categorize metaphors into two levels: The conceptual system and the linguistic expressions derived from it. For instance, the conceptual metaphor "argument is war" leads to expressions commonly used in discussions and debates, such as "I demolished your argument" (Lakoff & Johnson, 2003, p. 6). Metaphors help people understand "one kind of thing in terms of another" (Lakoff & Johnson, 2003, p. 5), particularly when dealing with complex and abstract concepts that can be better grasped through concrete objects. Consequently, the metaphor is created between two domains: the target domain that we attempt to comprehend and the source domain that helps us in this process. For example, the metaphor "genes are steering life" portrays genes as entities with

goals, aiding comprehension of their functions (Pramling & Säljö, 2007, as cited in Alshunnag, 2016, p. 73). This metaphor maps elements from the source domain of "human/person" onto the target domain of "genes."

Lakoff and Johnson (2003) further classify metaphors into three categories: structural, orientational, and ontological.

1. Structural metaphors: One concept or experience is "metaphorically structured in terms of another" (Lakoff & Johnson, 2003, p. 14). In the conceptual metaphor "argument is war," expressions like "he shot down all of my arguments" illustrate how arguments are understood through the lens of war (Lakoff & Johnson, 2003, pp. 4-5).
2. Orientational metaphors: These provide concepts with "a spatial orientation," such as health and sickness, where health is associated with "up" and sickness with "down." Examples include "he's in top shape" and "he's sinking fast," based on the perception that "serious illness forces us to lie down physically" (Lakoff & Johnson, 2003, pp. 14-15).
3. Ontological metaphors: These enable us to conceptualize thoughts and feelings as entities, making them quantifiable. For instance, in the metaphor "inflation is an entity," expressions like "inflation is lowering our standard of living" illustrate this concept (Lakoff & Johnson, 2003, pp. 25-26).

In the revised edition of their book, Lakoff and Johnson (2003) critically reassess their original taxonomy from 1980. They argue that the classification into structural, orientational, and ontological categories is "artificial," asserting that all metaphors are both structural and ontological, and many are orientational: "All metaphors are structural (in that they map structures to structures); all are ontological (in that they create target domain entities); and many are orientational (in that they map orientational image-schemas)" (p. 264).

Thus, while our corpus analysis considers the three-category classification, it

primarily adopts the revised two-type taxonomy. We will describe the metaphors in our corpus as either structural-ontological or orientational, as appropriate.

Translating Metaphors

The cognitive perspective has significantly influenced research on metaphor translation. Instead of viewing metaphors merely as linguistic expressions, this approach considers the conceptual frameworks of both the source language (SL) and the target language (TL) (Alshunnag, 2016, p. 51). This awareness highlights potential translation issues arising from the differences between SL and TL conceptual systems. For instance, Ashuja'a et al. (2019) assert that English and Arabic categorize metaphors differently (p. 26); thus, something considered a metaphor in one language may not be viewed as such in the other.

One key factor contributing to discrepancies between languages and resulting translation challenges is culture. Al-Hasnawi (2007) argues that culture significantly impacts the processes of "symbolization and conceptualization" (p. 4) within language systems. Differences in cultural perceptions and beliefs are reflected in the conceptual metaphors of each language and their linguistic expressions. Consequently, translating metaphors can be challenging, as they represent "human real-world experiences" that are often not identical across cultures (Al-Hasnawi, 2007, p. 10).

In this context, Al-Hasnawi (2007) suggests that metaphors may not always correspond to the same cognitive domains in both source and target languages (p. 493). This discrepancy complicates the translator's task, as they must engage in "conceptual mapping" to achieve "cognitive equivalence" for the target audience. The translator should introduce a new TL image that aligns with the target culture, a strategy referred to by Al-Hasnawi (2007) as "the strategy of different cognitive

mapping" (p. 8). When a similar cognitive domain exists in the TL, the translation can yield an equivalent metaphor. However, if such a mapping is unavailable, the translation process becomes more complex, potentially resulting in a simile, paraphrase, footnote, explanation, deletion, or an alternative metaphor. Al-Hasnawi (2007) differentiates between metaphors with "similar mapping conditions" and those with "different mapping conditions," which complicate translation decisions.

In the biomedical genre, Alshunnag (2016) examined the translation of metaphors from English into Arabic in articles from *Scientific American and Majallat al Ouloum*. He found that 93.57% of source text (ST) metaphors were preserved in the target text (TT) using elaboration, explication, and shifts to different TT metaphorical expressions that shared similar conceptualizations with the ST. In contrast, the use of different TT metaphors, non-metaphorical renditions, and deletions was less frequent (Alshunnag, 2016, pp. 283-284). His findings indicate that English and Arabic share many conceptualizations related to "natural domains" (Alshunnag, 2016, p. 290). Based on this data analysis, we will assess the extent to which the metaphors in our corpus are preserved in the target language. Before doing so, we will discuss the challenges associated with metaphors in the audiovisual context.

Metaphors in Audiovisual Translation

According to Pedersen (2015), while metaphors have garnered significant attention in translation research, few studies have addressed the complexities that arise in audiovisual settings. He argues that such settings introduce "layers of complexity" (p. 162), leading to challenges specific to various audiovisual translation modes, including dubbing, subtitling, and voice-over. This paper focuses on subtitling, which is widely used to translate audiovisual materials

worldwide. Díaz-Cintas and Remael (2014) define subtitling as:

> A translation practice that consists of presenting a written text, generally on the lower part of the screen, that endeavors to recount the original dialogue of the speakers as well as the discursive elements that appear in the image [...] and the information that is contained on the soundtrack (songs, voices off). (p. 8)

This definition implies that subtitling must address the multiple dimensions of the audiovisual product, making the task more complex. It is described as "a multi-layered and multi-semiotic mode of translation" (Bahaa-Eddin, 2006, p. 96). In the English-Arabic context, previous studies have indicated that challenges can be linguistic, cultural, and technical (Thawabteh, 2011, p. 40). Salhab (2017) emphasizes that subtitling must consider additional elements not present in written translation, such as subtitle placement on the screen and synchronization with the visuals (p. 27). Moreover, good segmentation and brevity are essential to enhance viewers' reading speed (Thawabteh, 2011). While linguistic difficulties arise in both translation and subtitling, they are exacerbated in the latter due to technical constraints affecting the translator's lexical, syntactic, and stylistic choices (Thawabteh, 2011, p. 27).

Furthermore, subtitling represents a unique form of audiovisual translation, transitioning from spoken to written language, which can lead to challenges related to dialects and registers. Salhab (2017) notes the difficulty of conveying spoken language features such as "tone or accents" in subtitles (pp. 30-31). If a "humorous effect" is intended, the subtitler may struggle to preserve the original message in the target text.

Given that this study focuses on children, it is crucial to consider their ability to understand both the content of the audiovisual material and the subtitles. Abu Ya'qoub (2013) highlights the importance of translators being aware

of children's cognitive levels and developmental stages, as well as the specificities of different age groups when selecting appropriate subtitling strategies (p. 92). Similarly, Salhab (2017) discusses these considerations in the context of science fiction films (p. 120).

In addition to the aforementioned challenges, Pedersen (2015) addresses the issue of "intersemiotic tension," which can be further complicated when metaphors are involved. He notes that various channels interact in audiovisual programs, including: (a) verbal channels of discourse: audio (spoken language) and visual (written language); and (b) non-verbal channels: audio (like music) and visual (what is displayed on the screen) (pp. 162-163).

Generally, "semiotic cohesion" among these different channels is necessary to effectively convey the program's message. However, "semiotic tension" can also enhance the visual appeal and impact of scenes (Pedersen, 2015, p. 169). In the case of "visualized metaphors," further challenges may arise due to this "polysemiotic context." Ambiguity can occur between the literal and figurative meanings of metaphors, particularly when the TL lacks an "equivalent expression" for such metaphors (Pedersen, 2015, pp. 162-163).

Given that technical constraints prevent subtitlers from including clarifications or footnotes, a lack of suitable solutions may exacerbate "intersemiotic tension." To address this issue, Pedersen (2015) recommends considering the "polysemiotic message" derived from all channels (p. 177). This includes aspects such as imagery, color, gestures, facial expressions, and the tone, stress, rhythm, and intonation of linguistic expressions, along with music and sound effects. Additionally, subtitlers must ascertain whether the SL and TL cultures share the same "image" used in the visualized metaphor; if not, their intervention may be necessary to ensure the audience comprehends the intended message of the SL (Pedersen, 2018, p. 31).

Corpus of the Study and Methodology

Two episodes from the animated series *Ask the StoryBots* form the corpus of our study. The StoryBots are five humorous creatures who embark on adventures to various places, such as planets and forests, in search of answers to children's questions about topics like animal types or the importance of recycling. Our study focuses on intersemiotic metaphors in episodes 2 and 8 from season II (Spiridellis & Spiridellis, 2018a, 2018b), which were streamed on Netflix in 2018. Both episodes address themes related to health, disease, and the human immune system.

In episode 2, titled "Why Can't I Eat Dessert All the Time?" (Spiridellis & Spiridellis, 2018b), Christina Applegate plays a bakery owner, while a piece of broccoli and a cupcake teach the StoryBots about healthy nutrition. Episode 8, "How Do People Catch a Cold?" (Spiridellis & Spiridellis, 2018a) features Wanda Sykes as a doctor, guiding the StoryBots on their journey to the Land of the Lymph to understand how a cold virus affects the human body.

The following section presents examples of intersemiotic metaphors along with the subtitling strategies employed to translate them. We identified the metaphors and analyzed the subtitling strategies used to translate them from English into Arabic, based on a combination of two taxonomies: Pedersen's (2015) taxonomy, which focuses on visualized metaphors, and Alshunnag's (2016) taxonomy, which pertains to metaphors in written translation within the biomedical genre, relevant to our corpus.

Pedersen's Taxonomy

Pedersen's (2015) taxonomy includes the following subtitling strategies:

1. Translation sensu stricto: word-for-word translation.
2. Substitution: replacing one figure of speech in the ST with another in the TT.

3. Paraphrase: replacing the metaphor with a non-metaphorical expression.
4. Compensation: where a metaphor replaces a non-metaphorical expression, or a metaphor is added where none existed in the ST.
5. Complete omission.
6. Specification: where a metaphor is rendered and also explained.
7. Retention: where a metaphor is transferred without translation. (pp. 155-156)

Alshunnag's Taxonomy

Alshunnag (2016) proposed strategies based on a combination of various scholars' approaches:

1. The TT metaphor corresponds linguistically and conceptually to the ST metaphor, which includes:
   a. Literal rendering of the ST metaphorical expression.
   b. Explication of the ST metaphorical expression in the TT.
   c. More elaborate translation of the ST metaphorical expression in the TT.
   d. Translation with a different TT metaphorical expression that is conceptually related to the ST metaphor.
2. The ST conceptual metaphor is rendered differently in the TT with a different conceptual and metaphorical expression.
3. The ST metaphorical expression is translated into a non-metaphorical expression in the TT, resulting in no conceptual metaphor.
4. The ST metaphorical expression is not rendered at all in the TT, leading to the deletion of the conceptual metaphor.
5. A new conceptual metaphor is created in the TT. (p. 61)

Proposed Taxonomy

After comparing the two categorizations and omitting strategies not relevant to our corpus or the English-Arabic translation pair, we propose the following taxonomy:

1. Retention: The original metaphor is maintained without translation.
2. Literal translation.
3. Different metaphorical expressions but similar conceptualization.
4. Elaboration: A metaphor is rendered and explained.
5. Different conceptual and metaphorical expressions.
6. Paraphrase: The metaphor is explained or rendered with a non-metaphorical word or expression, resulting in the loss of the metaphor.

In the following section, we will examine the strategies employed by the subtitler and assess the extent to which they conveyed the metaphorical meaning.

Analysis and Discussion

The examples presented below are categorized according to the composite taxonomy proposed in the previous section. While the metaphors in question are visualized, we will reference Lakoff and Johnson's (2003) categorization whenever applicable. However, it is important to note that this cognitive model does not fully encompass the complexity and diverse dimensions of intersemiotic metaphors.

Retention

Table 1

Example One

SL	TL	Time	Strategy
"What have you brought back today, Maxy?" (Spiridellis & Spiridellis, 2018a, 11:28-11:33)	ما الذي أحضرته معك اليوم يا ماكسي ؟ [What did you bring today Maxi?] (Spiridellis & Spiridellis, 2018a, 11:28-11:33)	Episode 8 11:28-11:33	Retention

This metaphor leverages intersemiotic effects, as "Maxi," a macrophage (a type of white blood cell), is depicted as a dog that brings everything in its path to its owner. The name "Max" is humorously associated with dogs, drawing the viewer's attention. This structural-ontological metaphor (Lakoff & Johnson, 2003) effectively conveys the abstract functions of lymphocytes in the human body, which may be difficult for children to grasp. The accompanying sound of barking reinforces the idea of a "faithful dog." The intersemiotic junction of text, sound, and image creates a rich intersemiotic metaphor, connoting loyalty, as lymphocytes are always prepared to protect the body from harm.

The translator retained the name "Maxi," as the image clearly depicts a dog, ensuring that the audiovisual channels (image and dialogue) are consistent. However, using an Arabic name for the dog could have been an alternative. In episode 2, the translator kept the name "Brock O. Lee," treating it as a proper noun rather than merely a reference to a vegetable. This wordplay in English elevates the character's status within the cartoon. The translator could have opted for "القرنبيط الأخضر" (broccoli) but likely chose the shorter form (بروك أولي , Brūk Ūlī) to optimize reading speed for young viewers.

Literal Translation

Table 2

Example Two

SL	TL	Time	Strategy
"Welcome to the land of the lymph!" (Spiridellis & Spiridellis, 2018a, 11:36-11:37)	أهلا بكم فى أرض اللمفاويات ! [Welcome to the land the lymphocytes!] (Spiridellis & Spiridellis, 2018a, 11:36-11:37)	Episode 8 11:36-11:37	Literal translation

This comparison immerses children in a realm of imagination, serving as a structural-ontological metaphor that portrays blood as a land filled with lymphocytes. This imagery can resonate with their real-world experiences related to space and planets, as they are naturally drawn to the mysteries of the sky. However, this depiction transforms into a magical world adorned with vibrant blue and purple colors, suggesting an enchanting experience. The linguistic expression intertwines a scientific metaphor—juxtaposing the universe with biology.

Older children may recognize the figurative meanings and connotations of the word "أرض " (arḍ), such as in "أرض الوطن" (arḍ al-waṭan), meaning "homeland." For younger children, this Arabic expression opens doors to their imagination, enhancing their engagement with the content.

Table 3

Example Three

SL	TL	Time	Strategy
(Helper T is talking) "There are many types of white blood cells. But we are all part of the immune system. We protect the body from all sorts of foreign invaders." (Spiridellis & Spiridellis, 2018a, 11:47-11:57)	(هيلبرتي تتحدث) هناك العديد من أنواع كريات الدم البيضاء و لكننا جزء من النظام المناعي. و نحن نحمي الجسم من كل أنواع الغزاة الخارجيين [(Helper T is talking) There are many types of white blood cells, but we are all part of the immune system, and we protect the body from all kinds of foreign invaders] (Spiridellis & Spiridellis, 2018a, 11:47-11:57)	Episode 8 11:47-11:57	Literal translation

The cartoon expands on the theme of space by comparing bacteria, viruses, and other infections to invaders seeking to conquer new territories, illustrating a structural-ontological metaphor. The subtitling effectively captures this concept, presenting an equivalent translation that successfully engages children's attention.

Table 4

Example Four

SL	TL	Time	Strategy
"Why is everybody acting this way? Because we're full of sugar!" (Spiridellis & Spiridellis, 2018b, 11:17-11:23)	لم يتصرف الجميع بهذه الطريقة؟ لأننا مليؤون بـ .. .السكر ! [Why is everyone behaving this way? Because we are full of sugar.] (Spiridellis & Spiridellis, 2018b, 11:17-11:23)	Episode 2 11:17-11:23	Literal translation

This structural-ontological metaphor suggests that overeating sugar is akin to being full of alcohol or being drunk. While the metaphor was literally translated, it could have been rendered as "لأننا ثملون،" which would be more appropriate for older children. Although the metaphorical meaning was conveyed by calquing the culture-bound expression "full of," a more natural Arabic equivalent would have been preferable.

Table 5

Example Five

SL	TL	Time	Strategy
"Welcome to Tummy University StoryBots!" (Spiridellis & Spiridellis, 2018b, 10:00-10:04)	أهلا بكم في جامعة "البطن" "يا "روبوتات المعرفة . [Welcome to Belly University StoryBots] (Spiridellis & Spiridellis, 2018b, 10:00-10:04)	Episode 2 10:00-10:04	Literal translation

In this scene, Jake the cupcake welcomes his guests and describes the stomach as a "university." The animated program employs a structural-ontological metaphor by replacing the real-life entity "stomach" with the concrete concept of "university," emphasizing that humans must learn what and how to eat. The subtitling strategy used here is "literal translation." Although this expression does not exist in Arabic culture, it was created in the English context for the cartoon's needs, producing a humorous effect that can be understood by Arab children with the aid of nonverbal elements, such as the accompanying image.

The colloquial term "tummy," commonly used with children, is translated into the standard Arabic term "البطن" (al-baṭan [belly]). This conventional term is suitable for all ages. While various Arab dialects offer words similar to "tummy" in register, the subtitler appears to favor standard Arabic to ensure clarity for all viewers in the Arab world.

Retention and Literal Translation

Table 6

Example Six

SL	TL	Time	Strategy
“Whoa! Who’s that guy? You mean old Dean Bananas? Forget him and feast your eyes on Alpha Kobbler Pie! Home of the sweetest parties on campus!” (Spiridellis & Spiridellis, 2018b, 10:06-10:20)	من هذا؟ تعني عميد الكلية القديم بنانا؟ إنس أمره و متع ناظريك! ألفا كوبلر باي مركز أجمل الحفلات في الحرم الجامعي! [Who is that? You mean the old college dean Banana? Forget about him and feast your eyes. Alpha Kobbler Pie! Centre of the most beautiful parties in the campus!] (Spiridellis & Spiridellis, 2018b, 10:06-10:20)	Episode 2 10:06-10:20	Retention and literal translation

One of the StoryBots notices a golden banana statue standing outside, and while he is amazed, Jake sees it as no longer significant. This metaphor can be classified as structural-ontological, as it describes a state represented by “a golden banana,” which connotes the golden age of fruits and vegetables that has now faded into history. Additionally, it highlights the concept of fashionable junk food.

The translation strategy employed here is a combination of literal translation and retention (borrowing), as the Arabic version maintains the word “banana” as a proper name. This use of “banana” may also carry a metaphorical, pejorative meaning intended for sarcasm, irony, or humor, suggesting that this kind of food is now considered “silly” and undesirable.

The contrast lies in the fact that while "banana" typically refers to a sweet, pulpy fruit we enjoy for dessert, the "old Dean" has become unnoticed, overshadowed by junk food. In this context, the old Dean "Banana" appears reduced to a mere humorous character, despite its intrinsic value behind the golden yellow peel.

The interplay of linguistic and intersemiotic elements is evident when considering the expression "Old Dean Banana" alongside the golden statue, which stands outside the "party." However, it is important to note that the Arabic translation does not fully capture the metaphorical meaning of the original. Given the constraints of the audiovisual context, finding a suitable alternative is challenging.

Different Metaphorical Expressions With Similar Conceptualization

Table 7

Example Seven

SL	TL	Time	Strategy
"Sugar may give you energy, but you crash hard" (Spiridellis & Spiridellis, 2018b, 16:11-16:16)	قد يمنحك السكر الطاقة ولكنك ستنهار سريعا. [Sugar may give you energy, but you will quickly collapse] (Spiridellis & Spiridellis, 2018b, 16:11-16:16)	Episode 2 16:11-16:16	Different metaphorical expressions but same conceptualization

The scene depicts police officers arriving to arrest the "drunk on sugar." This metaphor is structural-ontological, reflecting the frustration and weakness felt by the StoryBot who has overindulged in sugar at the party. The phrase "to crash" evokes the harmful physical and psychological effects often associated with alcohol consumption (Urban Dictionary, n.d.-a). The subtitling strategy effectively utilizes

a more natural Arabic expression, successfully conveying the metaphorical meaning and the character's predicament.

Table 8

Example Eight

SL	TL	Time	Strategy
"He will eat up anything in his path! He's actually quite friendly once you get to know him. Right " Maxy "? (Roww) (barking) He is so cute!" (Spiridellis & Spiridellis, 2018a, 12:04-12:08)	سيأكل ما يراه في طريقه! إنه لطيف حالما تتعرفون عليه، أليس كذلك يا "ماكسي"؟ (نبيح) !انه ظر بف جدا [He will eat what he sees in his path! He's friendly once you get to know him. Right " Maxy "? (barking) He is so cute!] (Spiridellis & Spiridellis, 2018a, 12:04-12:08)	Episode 8 12:04-12:08	Different metaphorical expressions with similar conceptualization

In this scene, Helper T uses the orientational metaphor "eat up" to convey that the macrophage, depicted as a kind dog, consumes harmful entities. This metaphor not only illustrates the protective role of lymph in the human body but also fosters appreciation among kids for its beneficial functions. The intersemiotic metaphor combines the visual representation of the lymph as a dog with the phrase "He will eat up," effectively depicting the scientific process of how lymph protects the body by destroying viruses.

Regarding the translation, the phrasal verb "eat up" cannot be directly transferred into Arabic. However, the subtitler successfully conveys the intended

metaphorical meaning, maintaining the essence of the original while adapting it to fit the linguistic and cultural context.

Table 9

Example Nine

SL	TL	Time	Strategy
"Where we're going? To fight back!" (Spiridellis & Spiridellis, 2018a, 13:46-13:49)	إلى أين نحن ذاهبون؟ للمقاومة! [Where are we going? To the fighting!] (Spiridellis & Spiridellis, 2018a, 13:46-13:49)	Episode 8 13:46-13:49	Different metaphorical expressions but similar conceptualization

In this scene, as the Bots ask Helper T where they are going while riding on Max's back, Helper T heroically declares, "to fight back!" This phrase employs an orientational metaphor that emphasizes the group's proactive stance. The accompanying sound of hooves and the visuals enhance this message, creating a rich polysemiotic effect.

The subtitler translated "to fight back" into the Arabic term "مقاومة" (muqāwama), which captures a similar conceptualization but employs a different metaphorical expression. Since there isn't a direct equivalent for the phrasal verb in Arabic, this choice effectively conveys the intended meaning. The interplay of image, sound effects, and the subtitled text maintains a cohesive and engaging message for the audience, ensuring that the essence of the scene is preserved in the target audiovisual product.

Elaboration

Table 10

Example Ten

SL	TL	Time	Strategy
"Line it up pledges, it's initiation time!" (Spiridellis & Spiridellis, 2018b, 10:20-10:23)	اصطفوا أيها المنتسبون الجدد حان وقت اختباركم! [Line up new affiliates, it's time for testing you!] (Spiridellis & Spiridellis, 2018b, 10:20-10:23)	Episode 2 10:20-10:23	Elaboration where a metaphor is rendered but also explained

In this scene, the newcomers are portrayed as students undergoing an initiation exam to join the fraternity, likened to an "Alcoholic Baptism" party, which symbolizes the beginning of a potential addiction to sugar. The term "pledges" carries a specific connotation in colloquial English, referring to those who must go to great lengths to be accepted into the fraternity (Urban Dictionary, n.d.-c). However, the Arabic translation does not fully capture this layered meaning. Despite this, the structural-ontological metaphor is preserved, allowing the audience to understand the initiation concept and its implications. The metaphor's impact remains intact, illustrating the challenges faced by the newcomers in a humorous yet thought-provoking manner.

Different Metaphorical Expressions and Conceptualization

Table 11

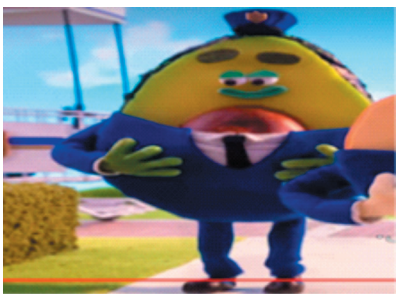
Example Eleven

SL	TL	Time	Strategy
“We’re fats! We’re good at protecting the cells in the body Yep, we’re fats. Fatsies for life.” (Spiridellis & Spiridellis, 2018b, 16:40-16:47)	نحن الدهون ! و نحن بارعون في حماية الخلايا في الجسم أجل، نحن الدهون. -الدهون تدوم [We are fats! We’re skillful at protecting the cells in the body. Yes! we’re fats. Fats last longer.] (Spiridellis & Spiridellis, 2018b, 16:40-16:47)	Episode 2 16:40-16:47	Different metaphorical expressions and conceptualization

In this scene, the cartoon employs a structural-ontological metaphor by likening healthy fats—represented by avocado, cheese, and fish—to police officers on patrol. Although these “officers” appear “fat,” they serve a protective role for the human body, effectively illustrating how beneficial fats support the immune system. This metaphor cleverly conveys the concept that not all fats are harmful; rather, some play a crucial role in health, making the idea accessible and relatable for children. The playful imagery reinforces the educational message while maintaining an engaging narrative.

Figure 1

Police Officer



Note. Figure taken from Spiridellis and Spiridellis (2018b).

In this intersemiotic metaphor, the phrase "Yep, We're fats. Fatsies for life" combines visual and auditory elements to create a playful and humorous depiction of healthy fats. The term "fatsy" serves as a wordplay, implying both a sense of camaraderie among the fats and a positive connotation of being "nicely put together" (Urban Dictionary, n.d.-b). However, this nuanced wordplay may not have been effectively translated into Arabic, potentially losing its playful and affectionate tone. The subtitler's challenge lies in preserving the humour and meaning of such wordplay while ensuring it resonates with the target audience, which may require a creative adaptation that captures the original intent.

Paraphrase: A Non-Metaphorical Expression

In this scene, the orientational metaphor "to stick around" effectively conveys the idea of remaining in a place, highlighting the character's reluctance to stay due to fear of the unfamiliar creature. The subtitler chose a non-metaphorical expression in Arabic, as the specific phrasal verb construction does not have a direct equivalent in the target language. While this choice may lead to a more straightforward translation, it also results in a loss of the metaphorical nuance that

adds depth to the character's emotions and the overall atmosphere of fear associated with the unknown. This highlights the inherent challenges in translating metaphors within the constraints of different languages and cultural contexts.

Table 12

Example Twelve

SL	TL	Time	Strategy
"I don't know, but I don't wanna stick around to find out. It's eating everything. -Whoa! It ate the virus." (Spiridellis & Spiridellis, 2018a, 10:26-10:30)	لا أعرف و لا أريد أن أبقى لأكتشف ما هي ! إنه يأكل كل شيء، لقد أكل الفيروس ! [I don't know and don't want to stay to know what it is! It is eating everything! It ate the virus!] (Spiridellis & Spiridellis, 2018a, 10:26-10:30)	Episode 8 10:26-10:30	Paraphrase non-metaphorical expression

Table 13

Example Thirteen

SL	TL	Time	Strategy
"A teeny tiny force of destruction and suffering" (Spiridellis & Spiridellis, 2018a, 7:02-7:05)	مخلوقات صغيرة جدا تسبب الدمار و المعاناة ! [Tiny creatures that cause destruction and suffering] (Spiridellis & Spiridellis, 2018a, 7:02-7:05)	Episode 8 7:02-7:05	Paraphrase

The structural-ontological metaphor "teeny tiny force" effectively conveys the idea of viruses as small yet powerful entities. In the translation, "force" is paraphrased as "مخلوقات" (makhlūqāt [creatures]), which provides a clearer understanding but loses some of the original metaphorical strength. While this choice makes the concept accessible to Arabic-speaking children, it shifts the emphasis from the idea of an impactful "force" to simply identifying the viruses as

"creatures." This demonstrates the balance translators must strike between preserving metaphorical richness and ensuring clarity for the audience.

Table 14

Example Fourteen

SL	TL	Time	Strategy
"Buckle up, Storybots. It's tummy time!" (Spiridellis & Spiridellis, 2018b, 8:46-8:47)	استعدوا يا "روبوتات المعرفة " حان وقت الطعام [Get ready Storybots, it's time for eating] (Spiridellis & Spiridellis, 2018b, 8:46-8:47)	Episode 2 8:46-8:47	Paraphrase

The metaphorical expression "It's tummy time!" serves as a structural-ontological metaphor that evokes joy and emphasizes the importance of mealtime for the stomach. By substituting "tummy" with " الطعام " (aṭa'ām), the translation broadens the meaning to encompass all food, which simplifies the concept for young Arabic-speaking viewers. This domestication approach reduces the foreignness of the original phrase, making it more relatable and fluent in the target language. This is in line with the view held by some Anglo-American theories regarding domestication as a way to achieve fluency and transparency in the translated version (Venuti, 1995).

However, this strategy may not always be optimal. For instance, retaining playful names like "Brock O. Lee" can enhance synchronization and maintain the humor integral to the character's identity. Thus, achieving a balance between domestication and foreignization is recommended (Tahraoui, 2020), as each approach serves different purposes depending on the context and the overall intersemiotic environment. The subtitler's choices should reflect an awareness of

the intended message, ensuring that the metaphor retains its effectiveness while also resonating with the target audience.

Findings and Discussion

Our analysis focused on key examples from episodes 2 and 8 of season II, highlighting a significant presence of intersemiotic metaphors, primarily structural-ontological ones. The study revealed that literal translation was the dominant strategy, often employed due to the shared biomedical concepts between English and Arabic (as seen in example three). In some cases, the subtitler might have struggled to find an appropriate equivalent (example four), or opted for simpler expressions to ensure comprehension among younger viewers.

Next in prevalence were different metaphorical expressions with similar conceptualization and paraphrase, used when a direct metaphorical equivalent could not be established. Strategies such as retention, elaboration, and the use of different conceptual and metaphorical expressions followed, often necessitated by grammatical or technical constraints, cultural nuances, and challenges posed by colloquial language or wordplay. However, they sometimes led to a loss of the metaphorical impact, particularly in cases where the polysemiotic communication system was involved (examples ten and fourteen).

Literal translation was the dominant strategy along with paraphrase and different metaphorical expressions with similar conceptualization to effectively convey scientific information and intersemiotic effects and also for screening purposes. Furthermore, translation strategies were joined in the form of couplet (two strategies) or triplet (three strategies gathered)——using Newmark's (1988) words——for the sake of achieving the intended TL metaphor (p. 91), especially to convey the intersemiotic and polysemiotic effect.

The combination of strategies——such as literal translation with retention (example six, where "بنانا" [banana] was retained) ——was crucial in effectively conveying linguistic and intersemiotic metaphors, especially in children's cartoons. Overall, most intersemiotic metaphors were preserved, aligning with Alshunnag's (2016) findings on biomedical metaphors, indicating many SL and TL metaphors share "similar mapping conditions" and belong to "similar cognitive domains" (Al-Hasnawi, 2007, p. 5). However, a few metaphors presented challenges due to differing symbolization or cognitive mappings (Al-Hasnawi, 2007), or were "monocultural" (Pedersen, 2015, p. 176), complicating the subtitler's task.

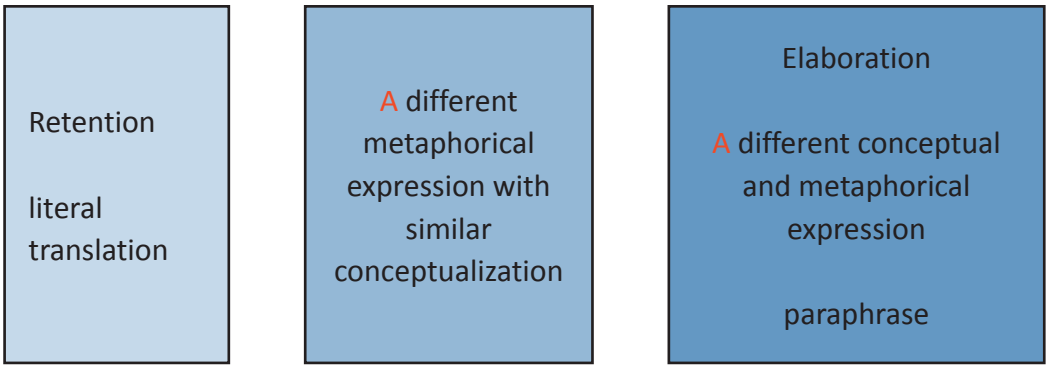
The audiovisual context further complicates metaphor translation, as various verbal and non-verbal channels can either support or challenge the subtitler's efforts. While non-verbal elements can enhance understanding, they can also create "intersemiotic tension" (Pedersen, 2015, p. 176) if the subtitled text contradicts the imagery.

In metaphor translation, especially visualized metaphors, there is a lack of clear guidance regarding the symbolization systems of the source and target texts. Cultural gaps often hinder straightforward translation strategies. Thus, while literal translation and retention may produce unnatural Arabic phrases, adapting the English style for Arab audiences is essential for effective learning. However, constraints related to time and space may necessitate the use of certain expressions to align with non-verbal elements, especially in science-themed content.

We propose a "polysemiolinguistic" or "intertersemiolinguistic" approach that combines polysemiotic and linguistic components, advocating for "different metaphorical expressions with similar conceptualization" whenever feasible. This strategy aims to balance the source's conceptual integrity with fluency and naturalness in the target language, ultimately enhancing the effectiveness of Arabic subtitling in children's media.

Figure 2

Proposed Taxonomy Within the Intersemiolinguistic Approach



Conclusion

This paper examined the strategies employed in subtitling intersemiotic metaphors in two episodes of *Ask the StoryBots*. Utilizing Lakoff and Johnson's (2003) cognitive model and Pedersen's (2015) concept of polysemiotic messages, our study demonstrated that the cartoon relies heavily on a metaphorical framework to engage children with scientific concepts in a fun and accessible manner. Given the intersemiotic nature of the metaphors, it is crucial for the subtitler to consider all audiovisual channels to effectively convey the intended meanings and effects.

The primary objectives for the subtitler include delivering the metaphorical meanings, maintaining intersemiotic cohesion among various channels, and ensuring that the young audience comprehends the content. To achieve these goals, the translation strategies must be adapted to both linguistic and intersemiotic metaphors.

While this study focused solely on subtitling audiovisual metaphors from English to Arabic across two episodes, further research is necessary to broaden the scope and enhance the validity and reliability of findings through statistical and

corpus tools. Additionally, the study did not incorporate surveys or interviews with target viewers, highlighting the need for audience reception studies that could illuminate viewer preferences and inform translation practices, including the choice of standard language versus dialects.

Moreover, the present study did not address the needs of children with disabilities, an important area that requires attention. Future research should focus on subtitling for the hard of hearing and deaf, as well as on audio description, to ensure accessibility for all audiences. This research was limited to one genre of educational cartoons; other genres, such as documentaries, remain underexplored in terms of dubbing, subtitling, and voice-over.

Finally, future studies could also consider translating programs from Arabic to English, exploring a range of linguistic, extralinguistic, and technical aspects. By expanding the research horizon, we can better understand and enhance the effectiveness of translation practices across various media formats.

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